

and the complex, have their places as causal influences, to be sought out and rectified side by side with, and sometimes even before, the correction of the more apparent physical dysfunctions."

Another interesting paper was that of Carroll S. Wright on "Nonspecific Therapy in Dermatology." This included a comprehensive discussion of *autohemotherapy*, *milk proteins*, *nonspecific vaccines* and *turpentine*. Autohemotherapy as an adjunct to local therapy in psoriasis has been found to be of definite value. It is also useful in certain cases of chronic urticaria. Milk preparations are useful at times in furunculosis and carbuncles; also in some types of itching dermatoses. In eczema, acne, and psoriasis they have been distinctly disappointing. Nonspecific vaccine therapy is of some value in psoriasis—a streptococcus fecalis—*Bacillus coli* vaccine being recommended for office use when a mild non-specific action is desired. Turpentine injections are of value in the treatment of trichophyton infections and certain bacterial infections. Way has been using turpentine by injection for several years in treating, successfully, such cases.

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Hypertonic Glucose Solutions for the Relief of Increased Intracranial Pressure.—That it is possible to lower the cerebrospinal fluid pressure by the intravenous injection of hypertonic solutions was demonstrated by Weed and McKibben and Weed and Hughson.^{1,2} The first practical application of this fact was shown by Haden, using concentrated solutions of glucose. The same results, though less pronounced, were shown by Cushing and Foley^{3,4} by the oral or rectal administration of sodium chlorid solutions. Later, Fay found that the intestinal administration of magnesium sulphate was twice as efficient as sodium chlorid for the reduction of intracranial pressure. This is explained by the fact that magnesium sulphate is nondialyzable and sodium chlorid is readily so. He also demonstrated that the continued administration of sodium chlorid may produce a secondary wave of edema and increased intracranial pressure due to its absorption and immobilization in the tissues with a subsequent attraction of fluid from the blood stream.

Howe,⁵ in an effort to determine what hypertonic solutions were least toxic and most efficient in lowering intracranial pressure when given intravenously, tested a dozen or more substances. Some were found too toxic and others ineffectual. He found that sodium chlorid produced the most pronounced decrease in intracranial pressure of any substance used, but is toxic unless given very slowly. He also found, as did Fay, that due to absorption of the salt in the tissues, there was a secondary wave of edema and an increase in intracranial pressure. He found that dextrose was absolutely nontoxic and never resulted in the slightest disturbance of respiratory or cardiac action, no matter how much or how quickly it was given. Fifty cubic centimeters of a 50 per

cent solution given in less than a minute had no untoward effect. He concludes "that dextrose is the only substance of this group which is non-toxic and produces a satisfactory fall in intracranial pressure." The practical application of this fact for the relief of increased intracranial tension as applied to head injuries and intracranial tumor is obviously most valuable.

In the treatment of acute head injuries, hypertonic solutions play an important rôle whether or not surgical interference is undertaken.⁶ Hypertonic glucose solution may be used as an aid to decompression in the reduction of cerebral edema, or in cases in which expectant treatment is adopted, it may by the reduction of intracranial pressure, render operation unnecessary. In the milder cases of concussion in which surgical interference is not indicated, it tends to promote recovery and diminish the tendency to sequelae. The treatment of head injuries by hypertonic glucose solution is a rational form of therapy, taking the place of magnesium sulphate which has been employed in a similar rôle for several years.

The indications for the employment of the hypertonic solutions in cases of intracranial tumor are chiefly for diagnostic purposes, as an emergency method of treatment, and for palliation. A patient suffering with a brain tumor, not uncommonly is in a semi-comatose condition when first seen. Several intravenous injections of 50 per cent glucose solution may be sufficient to restore consciousness, thereby making a complete examination, and localization of the tumor possible. If a patient with a brain tumor suddenly becomes comatose, an intravenous injection of a hypertonic solution may reduce the intracranial pressure sufficiently to enable operation to be done. Lastly, in cases awaiting operation or in inoperable cases the headaches and vomiting are often relieved by the use of hypertonic solutions.

The points in favor of the use of 50 per cent glucose are:

1. Its hypertonicity; reducing intracranial pressure.
2. Its small bulk.
3. Its usefulness in combating shock.
4. Its lack of untoward effects.
5. The rapidity with which it may be given.
6. Its food value.

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¹ Weed, L. H., and McKibben, P. S. Pressure Changes in the Cerebrospinal Fluid Following Intravenous Injections of Solutions of Various Concentrations. *Am. J. Physiol.*, 48, p. 512, May 1919.

² Weed, L. H., and Hughson, W. Systemic Effects of the Intravenous Injections of Solutions of Various Concentrations with Especial Reference to the Cerebrospinal Fluid. *Am. J. Physiol.*, 58, p. 53, November 1921.

³ Cushing, H., and Foley, F. E. B. Alterations of Intracranial Tension by Salt Solutions in the Alimentary Canal. *Proc. Soc. Exper. Biol. & Med.*, 17, p. 217, 1920.

⁴ Foley, F. E. B. Clinical Uses of Salt Solutions in Conditions of Increased Intracranial Tension. *Surg. Gynec. Obst.*, 33, p. 126, August 1921.

⁵ Armour, Donald. Some Considerations on Head Injuries, *Brain*, 51, p. 427, December 1928.

⁶ Brain, W. R., and Strauss, E. B. *Recent Advances in Neurology*. Philadelphia, P. Blakiston's Sons & Co., 1930, second edition, p. 100.